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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,813	03/04/2004	Jung Hoon Seo	1630-0138P	3656
2292	7590	09/19/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			MALDONADO, JULIO J	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/791,813	Applicant(s) SEO, JUNG HOON	
	Examiner Julio J. Maldonado	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2006.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 5-8 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hata et al. (U.S. 2002/0190263 A1) in view of Matsumoto et al. (U.S. 2003/0082893 A1) and Miyamoto (US 5,246,888).

Hata et al. (Fig.1) teach a light emitting device including a sapphire substrate (1); a III-V n-semiconductor layer (4), an activated layer (5), and a III-V p-semiconductor layer (9), formed in order, on top of the sapphire substrate (1); a transparent electrode (10); a p-pad electrode (11) formed on the top of the transparent electrode (10); and an n-pad electrode (12) formed on part of a mesa-cut section of the n-semiconductor layer (4) for extending an electric current (Hata et al., [0049] – [0056] and [0202]).

Hata et al. fail to disclose plasma activating the p-semiconductor layer. However, Matsumoto et al. (Fig.3) teach a related light emitting device including a sapphire substrate (21); a III-V n-type semiconductor layer (22), an active layer (24, 25, 26), and a III-V p-type semiconductor layer (28) formed in order on top of the sapphire substrate (21), wherein the p-type semiconductor layer (28) is activated and wherein said activation step includes a plasma treatment (Matsumoto et al., [0018] – [0037]). Furthermore, Matsumoto et al. teaches wherein said plasma treatment is an ashing

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process, i.e., an oxygen plasma treatment (Matsumoto et al., [0022]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Hata et al. and Matsumoto et al. to enable a plasma activated p-type semiconductor layer in Hata et al. according to the teachings of Matsumoto et al. for the further advantage of removal of organic contaminants from the p-semiconductor (Matsumoto et al., [0033]).

Still the combination of Hata et al. and Matsumoto et al. fail to disclose wherein said oxygen plasma is at a temperature less than about 600°C. However, Miyamoto teaches a semiconductor device including a substrate treated with ashing (oxygen plasma) at temperature of 200°C (Miyamoto, column 3, lines 4 – 20). Further support of ashing at temperatures around 200°C can be found in Kubota et al. to U.S. 6,501,014 B1 (column 20, lines 9 – 13). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Hata et al. and Matsumoto et al. to enable the oxygen treated layer Miyamoto et al because one of ordinary skill in the art at the time the invention was made would have been motivated to look to alternative suitable ashed treated layers in Hata et al. and Matsumoto et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine. MPEP 2144.07.

Still the combination of Hata et al., Matsumoto et al., and Miyamoto fail to disclose therein the oxygen plasma treatment is performed at a temperature less than about 600°C. However, in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. MPEP

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2144.05. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the plasma treatment disclosed in the combined teachings of Hata et al., Matsumoto et al. and Miyamoto to arrive at the claimed invention.

Response to Arguments

3. Applicant's arguments with respect to claims 5-8 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Applicants are encouraged, where appropriate, to check Patent Application Information Retrieval (PAIR) (<http://portal.uspto.gov/external/portal/pair>) which provides

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applicants direct secure access to their own patent application status information, as well as to general patent information publicly available.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio J. Maldonado whose telephone number is (571) 272-1864. The examiner can normally be reached on Monday through Friday.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax number for this group is 571-273-8300. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.



Julio J. Maldonado
September 14, 2006

Julio J. Maldonado
Patent Examiner
Art Unit 2823



GEORGE R. FOURSON
PRIMARY EXAMINER